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Review of implementation of Agenda 21 and the Johannesburg Plan of Implementation: a 10-year framework of programmes on sustainable consumption and production patterns

Report of the Secretary-General

Summary

Eco-efficiency has been improving throughout the past century. Still, absolute consumption of resources has continued to increase with population and gross domestic product in both developed and developing countries and has even accelerated since 2000 with the rapid growth of emerging economies. Yet large segments of the population in developing countries still lack access to basic goods and services. It is also becoming clear that development has exceeded the carrying capacity of ecosystems in various geographic areas, whether measured using a "footprint" analysis or any number of indicators such as endangered species, degraded ecosystems and land, deforestation or decline in fish stocks.

Therefore, more concerted efforts will be needed to delink economic growth from natural resource extraction and environmental degradation, and to mainstream sustainable consumption and production in policy development and implementation. A life-cycle approach is valuable in gaining perspective on how consumption and production choices are interrelated and can have complex, sometimes unintended, consequences for sustainable development.

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Particular attention is needed to consumption choices, where progress towards sustainability has been limited. The concept of green economy, or green growth, is gaining wider currency as a way of reconciling environmental sustainability with continued improvement in living standards, particularly in developing countries. Best practices are emerging on sustainable procurement, renewable energy, energy efficiency, green buildings, sustainable supply chain governance, and mainstreaming corporate responsibility. Less is known about the proper mix of measures — voluntary, market-based and mandatory — that can lead to sustainable consumption and production. Yet, in many cases, the constraints are behavioural and political rather than technological, calling for more awareness-raising and education.

The challenge of a 10-year framework of programmes on sustainable consumption and production patterns is to facilitate a swift shift in unsustainable consumption and production patterns in order to remain within the carrying capacities of ecosystems while ensuring upward convergence in living standards across the planet.

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I. Background

1. The present report provides a brief review of the state of implementation of the goals and commitments related to changing unsustainable patterns of consumption and production as mandated by the Commission on Sustainable Development at its eleventh session.[1] It highlights continuing challenges as well as constraints and obstacles that countries face in implementing policies and programmes which further sustainable consumption and production and sustainable development. This report should be read in conjunction with the separate reports of the Secretary-General on waste management, chemicals, transport and mining, which are also before the Commission at its current session, as well as the report on trends in sustainable consumption and production, which provides a graphic picture of both the progress achieved and remaining challenges.

2. The report was prepared using information and data from countries' national reports submitted to the Commission, results of the regional implementation meetings and meetings of the Marrakech Process on Sustainable Consumption and Production, and analyses carried out by relevant major groups as well as other institutions and organizations that focus on sustainable consumption and production. The report has benefited from the contributions of the United Nations Environment Programme (UNEP) as well as inputs from other United Nations agencies.

A. History and mandates

3. During the Rio de Janeiro Summit in 1992, the issue of "sustainable consumption and production" was elaborated in chapter 4 of Agenda 21.[2] Ten years later, at the World Summit on Sustainable Development in Johannesburg in 2002, all countries agreed that "Poverty eradication, changing unsustainable patterns of production and consumption and protecting and managing the natural resource base of economic and social development are overarching objectives of, and essential requirements for, sustainable development".[3] Specifically, in chapter III of the Plan of Implementation of the World Summit on Sustainable Development (Johannesburg Plan of Implementation), Member States and civil society were called upon to:

> Encourage and promote the development of a 10-year framework of programmes in support of regional and national initiatives to accelerate the shift towards sustainable consumption and production to promote social and economic development within the carrying capacity of ecosystems by addressing and, where appropriate, delinking economic growth and environmental degradation through improving efficiency and sustainability in the use of resources and production processes and reducing resource degradation, pollution and waste. All countries should take action, with

[1] See *Official Records of the Economic and Social Council, 2003, Supplement No. 9* (E/2003/29), chap. I, sect. A, draft resolution I, annex.

[2] *Report of the United Nations Conference on Environment and Development, Rio de Janeiro, 3-14 June 1992*, vol. I, *Resolutions Adopted by the Conference* (United Nations publication, Sales No. E.93.I.8 and corrigendum), resolution 1, annex II.

[3] *Report of the World Summit on Sustainable Development, Johannesburg, South Africa, 26 August-4 September 2002* (United Nations publication, Sales No. E.03.II.A.1 and corrigendum), chap. I, resolution 2, annex, Plan of Implementation of the World Summit on Sustainable Development ("Johannesburg Plan of Implementation"), para. 2.

developed countries taking the lead, taking into account the development needs and capabilities of developing countries, through mobilization, from all sources, of financial and technical assistance and capacity-building for developing countries.[4]

4. Progress in the thematic cluster of sustainable consumption and production patterns is a cross-cutting issue in the multi-year programme of work of the Commission, and as such has been reviewed in past sessions of the Commission in relation to specific thematic clusters.

5. Sustainable consumption and production is about how humanity produces an adequate supply of goods and services for everyone while putting less pressure on the environment and ecosystems. In short, it is about delinking economic and social well-being from environmental degradation. The Brundtland Commission clearly recognized the ultimate limits to the carrying capacity of the resource base and that "long before these are reached, the world must ensure equitable access to the constrained resource and reorient technological efforts to relieve the pressure".[5]

B. New context

6. Over the past two years, the world has witnessed the emergence of multiple global crises, which have affected economic activity as well as social and economic goals (including the Millennium Development Goals) adversely. Enhanced volatility of energy and food prices, global food shortages and water scarcity have, most recently, been overshadowed by a global financial crisis. Adding to the complexity of the situation is climate change, which threatens to exacerbate the impact of other crises. These challenges, however, have provided opportunities to reshape investment and development patterns, to create new jobs in the "green economy", and to manage resources more sustainably, including through strengthened international cooperation and innovative business models.

7. The challenge of a 10-year framework of programmes is to ensure a quick transition to sustainable consumption and production patterns to remain within the carrying capacities of ecosystems while ensuring upward convergence in standards of living within and between countries. The objectives of the Framework are to advance economic and social development while at the same time quickly decoupling that process from environmental degradation and ecosystem destruction. Viewed differently, sustainable consumption and production seeks to identify and strengthen synergies between sound stewardship of the Earth's resources and improvements in the well-being of all humanity, especially of the poor.

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[4] Ibid., para. 15.

[5] United Nations, *Our Common Future*: Report of the World Commission on Environment and Development (1987), Chapter 2: Towards Sustainable Development (A/42/427, para. 10). The Club of Rome 1972 Report, *Limits to Growth*, made a similar argument regarding the use of non-renewable materials in a finite world, though the timeline proved to be too pessimistic.

II. Review of progress

A. Global consumption of resources

8. The global population has more than quadrupled since the beginning of the twentieth century, and global GDP increased 23-fold, resulting in a 5.5-fold increase in income per capita. However, income gains have been very unequally distributed and a culture of "consumerism" has developed among higher income groups.[6] The 20 per cent of the population in the highest-income countries accounted for 77 per cent of total private consumption in 2005, while the poorest 20 accounted for only 1.3 per cent.[7]

9. A number of methodologies have emerged in recent years for assessing the relationship between final consumption and material use. These include life-cycle analysis (which traces material consumption throughout a product's life cycle), footprint analysis (which converts consumption into an area-based numeraire), and material flow analysis (which aggregates material consumption by tons of four basic categories — metals, minerals, fossil fuels and biomass). Material flow analysis is the least invasive methodology, since it is based on official data and does not make any assumptions with regard to environmental impacts or relative carrying capacity. Still, it provides a useful tool to assess whether there has been a significant decoupling of global resource use from economic and population growth.[8]

10. In line with the growth of population, income and output, global material use (both aggregate and per capita) as well as total primary energy supply (TPES) have been increasing since 1900, with marked increases since 1960 (see figure 1). Total material consumption (metals, industrial and construction minerals, fossil fuels and biomass) has increased almost eightfold from 7.5 billion tons in 1900 to 59 billion tons in 2005.[9] This is about double the increase in population, but only 40 per cent of the increase in global GDP. However, the pace of material use has increased since 2000 and extraction of iron ore, bauxite, copper and nickel is now rising faster than the world GDP.[10] For the first time, these increases in resources used per capita are driven by emerging economies.

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[6] World Business Council for Sustainable Development, "Sustainable Consumption Facts and Trends from a Business Perspective: The Business Role Focus Area" (Geneva, Switzerland, 2008).

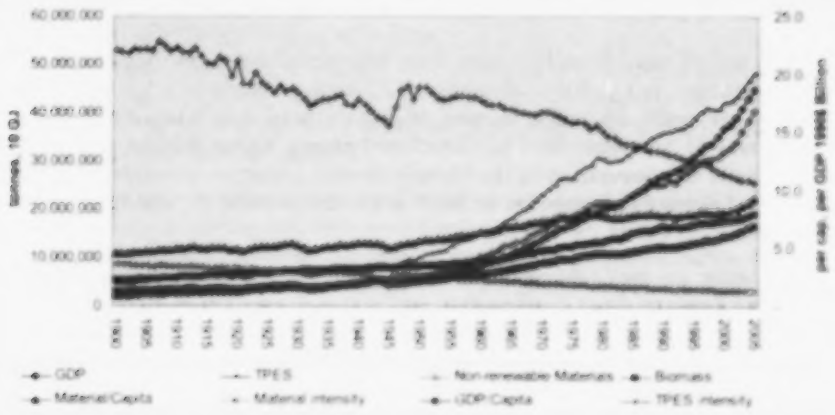
[7] http://www.globalissues.org/issue/235/consumption-and-consumerism (accessed 27 January 2010).

[8] The data for these analyses is available through the European Union-supported online Portal for Material Flows. Available from http://www.materialflows.net/.

[9] F. Krausmann, S. Gingrich, N. Eisenmenger, K-H. Erb, H. Haber and M. Fischer-Kowalski, "Growth in global materials use, GDP and population during the 20th century", *Ecological Economics*, vol. 68, issue 10 (2009), pp. 2696-2705.

[10] T. Jackson, "Prosperity without Growth? — the transition to a sustainable economy" (United Kingdom, Sustainable Development Commission, 2009).

Figure 1
Long-term trends in resource and energy use intensity



Source: Derived from Krausmann et al., 2009.

11. Notably, while there was some decline in resource use per unit of GDP (relative decoupling), it was outweighed by the increase in GDP, and thus resulted in increased absolute use of material and energy — the so-called rebound effect. In fact, material consumption has increased at an average of 2 per cent per year. This has been especially evident in home heating or cooling devices and personal transportation.[11] There is no evidence of global absolute decoupling.

12. At a country level, some economies, mainly industrialized, have seen relative decoupling of both resource use and environmental impacts from economic growth (see box 1). In a few instances there has even been absolute decoupling. While structural factors (especially the growing share of services in more affluent economies) are a main driver of relative decoupling, transformational policies, including the setting of ambitious national targets (as done by Denmark and Costa Rica), would be needed to achieve absolute decoupling. Besides countries, some companies have also adopted decoupling targets, e.g., for carbon (Timberland), water neutrality (Coca Cola Enterprises), and closed loop/zero waste (Dupont, Toyota).

[11] See footnote 5.

Box 1

What is decoupling?

Decoupling refers to the relationship between (a) economic and social variables, such as GDP or the Human Development Index, and (b) environmental variables, such as resource use or environmental degradation. It is important to distinguish between resource decoupling — progressively reducing the material inputs needed to produce additional units of output — and impact decoupling — reducing the adverse environmental consequences between relative and absolute decoupling and between renewable and non-renewable resources.

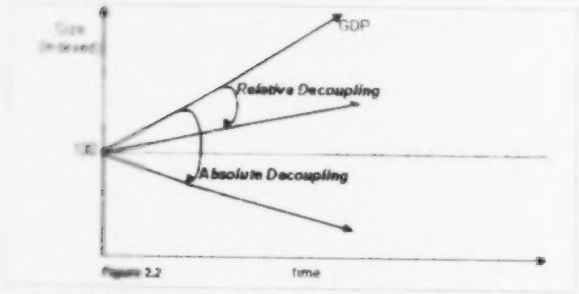


Figure 2.2 Stylized representation of the distinction between "absolute" and "relative" decoupling

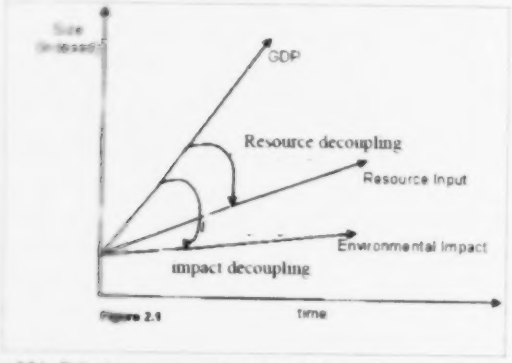


Figure 2.1 Stylized representation of the distinction between "Resource" and "Impact" decoupling

Source: T. Jackson, 2009.

13. Regional differences in material use are driven by differences in lifestyle, affluence, population, geography and technological sophistication. North America's per capita material consumption is 3 times, and Western Europe's is 1.6 times, the world average (using ecological footprint measures; see below). Before the past two

decades, material use in developing countries with biomass-based economies had been driven mainly by population growth. However, this is changing as urban populations grow rapidly and emerging countries develop and industrialize. From 1900 to 2000, the number of city dwellers rose from 220 million to 2.8 billion, a tenfold increase,[12] reflected in a thirty-fourfold increase in construction minerals and a twenty-sevenfold increase in ores and industrial minerals. Over the past century, developing country populations increased sixfold while they tripled in industrialized nations; now 85 per cent of the population lives in developing countries.[13] Yet, with only 15 per cent of the population, industrialized nations use 50 per cent of the fossil energy, industrial minerals and metallic ores, though this is slowly changing.

B. Role of technology

14. Advances in technology have provided opportunities to accelerate development (e.g., green jobs, new market opportunities) and increase eco-efficiency, but they also present downsides and risks. The rapid growth and increasing convergence between information and communications technologies (ICT) have enabled innovative business and service delivery models for development — the classic example being the "village phone" innovation from Grameen Bank. However, the ICT revolution has also produced new material flows of hazardous and other hard-to-treat material, posing significant sustainability challenges. The volumes of second-hand electronics products and e-waste that are exported to developing countries, where metal recovery takes place without formal treatment facilities, pose important health and environmental challenges.

15. Biotechnology and nanotechnology are seen as carriers of enormous transformative potential but also with unknown risks. The opportunities as well as risks are at an early stage of development, although moving quickly. It will be prudent to ensure from the outset that they are deployed in ways that mitigate the risks and reduce resource and energy use (see box 3), for example, through product review processes that ensure sustainability requirements before introduction to the market.

16. The rapid growth in world trade globalization of supply chains has magnified both the challenges and opportunities of sustainable consumption and production. A number of developing countries have emerged as major production centres, thus creating economic opportunities for sustainable development.[14] This trend has also enabled the rapid diffusion of environmentally sustainable technologies from advanced to developing countries. International cooperation under the auspices of multilateral environmental agreements has contributed to this diffusion. The Montreal Protocol has shown how quickly ozone-friendly technologies could be introduced. But a framework needs to be in place to support technology diffusion

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[12] United Nations Population Fund, "State of World Population 2007: Unleashing the Potential of Urban Growth" (New York, 2007). See http://www.unfpa.org/swp/2007/english/chapter_4/index.html.

[13] Industrialized = members of the Organization for Economic Cooperation and Development (OECD), other Eastern European countries and the Russian Federation, Krausmann et al., 2009.

[14] G. Peters and E. G. Hertwich, "Pollution Embodied in Trade: The Norwegian Case", *Global Environmental Change*, vol. 16, issue 4 (2006), pp. 379-387.

and transfer and to build capacity in developing countries where needed to utilize environmentally sound technologies.

17. However, the globalization of production makes it difficult to estimate national or regional resource intensities, since consumers in developed countries are increasingly importing resource-intensive products from developing countries. Hence, a reduction in the resource use in the former is partly explained by a transfer of resource-intensive activities to the latter. For instance, in the case of greenhouse gas emissions, if CO_2 embodied in trade were included in the United Kingdom inventory, CO_2 emissions would have risen by 11 per cent between 1990 and 2005 instead of the nationally reported decline of 6 per cent.[14] Twenty-seven countries have an external water footprint (water used in goods they import) that accounts for more than 50 per cent of their total water consumption.[15] It also means that the resulting environmental impacts and resource use are increasingly embodied in trade[16] and are increasing over time. The World Economic Forum estimates that one third of China's emissions are due to exports.[17]

18. The challenge of exhaustion of non-renewable resources, together with the recent rise and heightened volatility of commodity prices, is essentially a global one. There is a need to find internationally agreed solutions on measuring and equitably allocating reduction targets of embodied resource use and pollution, including materials, water and CO_2, and in ensuring that clean technologies and innovative business models are available to achieve these targets. Solutions should also aim to reduce risks and increase the resilience of communities and economic and trade systems.

C. Staying within ecosystems' carrying capacities

19. Various efforts have aimed to assess whether economies operate within the carrying capacity of ecosystems. Global and multidisciplinary efforts, such as the Millennium Ecosystem Assessment and the International Assessment of Agricultural Knowledge, Science and Technology for Development, have assessed the health of the Earth's biodiversity and agroecological zones, and other environmental services. Together they find that human activity is putting such a strain on the Earth's ecosystems that 60 per cent of the ecosystem services are being degraded or unsustainably used, and the ability to sustain future generations is being jeopardized. Land degradation affects 1.9 billion hectares (and 2.6 billion people) and irrigated agriculture uses 70 per cent of freshwater withdrawal globally. As water and land scarcity increases, often compounded by climate change, business-

[15] The World Wildlife Federation water footprint — volume of water used to produce the goods and services consumed in a country — includes water use from both domestic and external (water used in producing the goods in the exporting country) sources. Worldwide, external water use accounts for 16 per cent of the water footprint. For 27 countries, more than 50 per cent of their water footprint is external.

[16] For instance, "embodied carbon" refers to carbon dioxide emitted at all stages of a goods' manufacturing process, from the mining of raw materials through the distribution process, to the final product provided to the consumer. J. Kejun, A. Cosbey and D. Murphy, "Embodied Carbon in Traded Goods" (International Institute for Sustainable Development, Winnipeg, Canada, 2008).

[17] World Economic Forum and Deloitte, Touche, Tohmatsu, "Sustainability for Tomorrow's Consumer: The Business Case for Sustainability" (Geneva, Switzerland, 2009).

as-usual agricultural practices will not be enough to meet the projected 75 per cent increase in global cereal and doubling in meat demand between 2000 and 2050.

20. Other efforts led by the Ecological Footprint Network have focused on designing country-level and Global Ecological Footprint as well as ecological capacity. The Network finds that, globally, economies exceed the planet's capacity by 33 per cent. The World Wildlife Federation water footprint measures the proportion of a country's ecological footprint that is covered by national versus other countries' biocapacity through imports. No single measure of world water supply is available. But countries exceeding their biocapacity have gone from none in 1960 to 24 at present (including in North America, the European Union, the Middle East and Asia-Pacific regions).

21. These findings are supported by a prominent recent scientific article that defines nine Earth biophysical services and carrying capacity for each that should not be exceeded to ensure stability.[18] Three — the rate of biodiversity loss, interference with the nitrogen cycle and climate change — have already exceeded their carrying capacity. Another four — global freshwater use, change in land use, ocean acidification and interference with the global phosphorous cycle — are getting close to their thresholds. Though there are scientific differences on how some of these trends should be measured, there is considerable support for the central message, that global consumption is using resources (increasingly non-renewable) faster than the planet can regenerate them, and using them in ways that produce more and faster damage than many natural systems can absorb.

III. Enabling policy framework to transition to sustainable consumption and production

22. All actors have a role to play in changing consumption and production patterns. However, Governments need to provide a policy framework that gives clear signals and information to both producers and consumers, and support them with effective, open and transparent legal and administrative structures.

23. From land use planning to building codes, to trade, fiscal and other economic and social policies, including regulatory, procurement as well as economic instruments, Governments have the capacity to shape market conditions towards the adoption of sustainable consumption and production. Failure to internalize environmental and other externalities often provides incentives for unsustainable behaviour.

A. No silver bullets — framework of actions needed

24. A shift to sustainable consumption and production requires a mix of policies, regulations, regional and international cooperation and long-term vision and planning. In order to begin the process of policy design, incentive structures and awareness-building, Governments had agreed in Johannesburg to develop a 10-year

[18] J. Rockstrom et al., *Nature*, vol. 461, pp. 472-475 (September 2009). See http://www.nature.com/nature/journal/v461/n7263/full/461472a.html (accessed 23 September 2009).

framework of programmes and followed it up with the Marrakech Process to identify and implement concrete programmes and projects, based on collaboration and partnerships, through consultations, national round tables and task forces (see box 2).

Box 2
What is the Marrakech Process?

The Marrakech Process is a global multi-stakeholder process to promote sustainable consumption and production and work towards a 10-year framework of programmes on sustainable consumption and production. Led by the United Nations Department of Economic and Social Affairs and UNEP, this process has developed and expanded networks and communities of practice at national, regional (e.g., African Round Table on Sustainable Consumption and Production, Latin American Regional Council on Sustainable Consumption and Production) and international levels (e.g., seven task forces) with the active participation of Governments, major groups and other stakeholders. The Process provides examples of best practices, policies and sustainable consumption and production analytical tools, as well as the types of institutions, partnerships and projects that can help to implement sustainable consumption and production in practice. It has supported the development of regional strategies, pilot projects and capacity-building activities and North-South cooperation, and promoted knowledge-sharing through regional institutions and regional and international meetings as well as websites.

The Marrakech task forces are voluntary initiatives led by Governments focusing on seven specific themes: (a) "Education for sustainable consumption", (b) "Sustainable tourism", (c) "Sustainable public procurement", (d) "Sustainable products", (e) "Sustainable buildings and construction", (f) "Cooperation with Africa" and (g) "Sustainable lifestyles".

For more information, see www.unep.fr/scp/marrakech and www.desa.org/marrakech.

Regional activities

25. Partly in response to the Johannesburg Plan of Implementation and to the Marrakech Process, the European Commission has put forward a sustainable consumption and production and sustainable industrial policy, an action plan that includes a range of activities such as promotion of eco-design, green public procurement, labelling, boosting resource efficiency and lean production.

26. The African region has developed a regional 10-year framework of programmes on sustainable consumption and production with energy, water and sanitation, habitat and sustainable urban development, and renewable resource-based industrial development as priorities. With the support of the Marrakech

Process Task Force on Cooperation with Africa, implementation has started through nine projects.

27. The Asia-Pacific region has opted for a green-growth strategy based on greening of business and markets, building sustainable infrastructure, green tax and budget reform, investment in natural capital, and eco-efficiency through cleaner production. Policies and strategies to support these include: economic instruments, eco-tax reform, green procurement, public information disclosure, and product stewardship tools.[19]

28. The Latin American and Caribbean region has launched its regional Sustainable Consumption and Production Strategy supported by the Marrakech Process and set up a Council of Government Experts on Sustainable Consumption and Production. The regional strategy established five sustainable consumption and production priorities: (a) national sustainable consumption and production policies and strategies, (b) sustainable consumption and production in small and medium enterprises, (c) sustainable public procurement, (d) sustainable lifestyles and (e) information and knowledge management networks.[20] These priorities were confirmed at the regional implementation meeting, while incorporation of sustainability in the construction sector was added.

29. The Arab region has developed the Arab Regional Strategy for Sustainable Consumption and Production,[21] where six sustainable consumption and production priorities were identified: (a) energy for sustainable development, (b) water and waste management, (c) rural development and poverty alleviation, (d) education, (e) sustainable lifestyles and (f) sustainable tourism. Draft regional implementation programmes for the Strategy were also identified during the regional implementation meeting and approved by the Council of Arab Ministers Responsible for the Environment.

Sustainable consumption and production at the national level

30. More than 30 countries (including the Czech Republic, Finland, the United Kingdom of Great Britain and Northern Ireland, Ethiopia, Senegal, Argentina, Jamaica and Thailand) have now developed or are developing national programmes on sustainable consumption and production.[22] Some other countries have prioritized the development of national sustainable consumption and production programmes or action plans,[23] while others have started putting in place activities, policies and programmes without necessarily a national framework.[24] To support these developments, the Marrakech Process has developed Guidelines and used them in

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[19] United Nations, Economic and Social Commission for Asia and the Pacific, *Green Growth at a Glance: The Way Forward for Asia and the Pacific* (Environment and Sustainable Development Division, Bangkok, 2006).

[20] Fifth Meeting of the Council of Government Experts of Latin America and the Caribbean for Sustainable Consumption and Production, Cartagena, Colombia, September 2009.

[21] A collaborative document by UNEP, the League of Arab States and the Economic and Social Commission for Western Asia.

[22] The UNEP Clearinghouse for National SCP Programmes provides information on existing and in-development SCP programmes (UNEP, Report on National SCP Programmes, March 2007).

[23] Second International Expert Meeting on the 10-Year Framework of Programmes, Costa Rica, September 2005. Marrakech Process. See www.unep.fr/marrakech.

[24] Arab Regional Strategy for Sustainable Consumption and Production, 2009.

several demonstration projects as well as in awareness- and capacity-building activities.

31. A few countries have identified specific sustainable consumption and production targets. Germany, Austria and Denmark have resource decoupling targets. Germany aims to double its energy and raw material efficiency compared to 1990[25] and in the long term to reduce resource consumption absolutely by 50 per cent. Denmark aims to limit long-term resource consumption to 25 per cent of the current level. Austria aims for stabilization of absolute resource consumption in the short run and a fourfold increase in resource efficiency in the long run. Other countries have energy efficiency and renewable energy targets. China has a national renewable energy goal of 15 per cent by 2020, and 4 per cent annual improvements in energy efficiency. New Zealand has a renewable energy target of 90 per cent by 2025. Brazil aims to avoid 6,400 MW in additional capacity through energy efficiency by 2030. Mexico aims to reach a 26 per cent renewable energy target by 2012 and a halving of carbon by 2050. Several countries have pledged carbon neutrality — the Maldives by 2020, Costa Rica by 2021, Norway by 2030 and Sweden by 2050. California has a target of 33 per cent renewable energy and reduction of 20 per cent in per capita water use by 2020 as well as zero net energy use for all new residential buildings by 2020 and commercial buildings by 2030. At the city level, 1,016 mayors have joined the United States Conference of Mayors' Climate Protection Agreement, vowing to reduce carbon emissions in their cities below 1990 levels, in line with the Kyoto Protocol. Decoupling utilities' revenues from actual energy sales by ensuring fixed utilities' revenues, as was done in California, allows utilities to pursue demand-side management and increase energy efficiency.

Sectoral approaches to implement sustainable consumption and production

32. Various regions and countries have focused action on high-impact sectors with the highest resource use and pollution. For instance, research has indicated that food and drinks have the highest levels of ecological impact per dollar spent, followed by household electrical equipment and housing. In absolute terms, food, private transport and housing have the most significant impacts.[26]

Green stimulus packages

33. Some economic stimulus measures in response to the global financial crisis and economic downturn were also aimed at advancing sustainable consumption and production. Although it is too early to assess their impact,[27] the broad range of these measures (including transport and water infrastructure spending in China, energy efficiency in buildings in Mexico and France, and public transport spending in the Republic of Korea)[28] is instructive. These investments could contribute to positive

[25] Sustainable Europe Research Institute (SERI), Online Portal for Material Flow Data. See www.materialflows.net/ (accessed 10 September 2009).

[26] World Business Council for Sustainable Development, 2008, and European Environment Agency.

[27] Based on estimates of HSBC Global Research; these concentrate on climate change investment themes, and thus account for a large portion of investments that contribute to the shift to the green economy. Source: N. Robins, R. Clover and C. Singh, "A Global Green Recovery? Yes, but in 2010" (HSBC Global Research, London, August 2009).

[28] http://www.unep.org/pdf/G20_policy_brief_Final.pdf.

changes and yield important lessons. They are part of a new movement for a green economy that calls for increased resource efficiency, decoupling economic growth from environmental degradation, and creating decent green jobs.

B. Business innovation for sustainable consumption and production

34. From sole traders in informal markets to global corporations, businesses are key agents in production and consumption. Sustainable consumption and production thinking needs to become "business as usual" in decisions about finance and insurance, product development, innovation, production and delivery that increasingly focus on offering services as opposed to products. So far most Governments have relied on voluntary measures, which are not sufficient in themselves. Complementary regulatory and market-based measures that create the necessary incentives to change the core business model and align resource use and resource costs are also necessary. For instance, the European Union extended producer responsibility regulation, although focused on the end of life, has impacted across the life cycle, making recyclability and ease of disassembly an essential part of the design brief for cars and electronic equipment. The World Economic Forum finds that the cost of water around the globe is negligible compared to other inputs, and thus water is rarely seen as a priority when business attempts to reduce production costs.[29] Unless resources prices reflect their scarcity, incentives to reduce their use in production are limited.

35. The World Business Council for Sustainable Development proposes three roles for business in mainstreaming sustainable consumption: (a) innovation, (b) choice influencing and (c) choice editing.[30] All three roles pertain, in one way or another, to the governance of the commodity chain, especially through the embedding of sustainability principles into the core business model. For instance, life-cycle analysis of cars and electronics demonstrates that the largest environmental impact occurs during the use phase of the products as opposed to the manufacturing phase. That underlines the need for major innovation in design (eco-efficiency, design for environment) to develop improved products that use fewer resources during the consumption phase. Business can use marketing and communication and awareness-raising campaigns, especially in partnership with non-governmental organizations and other third parties, to encourage the use of more sustainable products and services. Business can also remove unsustainable products and components from the marketplace. Of course, this has to be done in partnership with other actors in society, including competitors, and may require international cooperation.[30] For instance, "radical collaboration" where alliances between former competitors are created to solve problems together could be applied to the sustainability movement.

36. "Choice editing" by retailers refers to the imposition of standards on purchases e.g., when businesses eliminate certain compounds from their supply chains (as Wal-Mart did with seven hazardous chemicals). This can be a powerful tool, but care is needed to avoid anti-competitive consequences where only larger suppliers are able to deal with assurance procedures. However, supply chain management is both a powerful lever and a good example of a technique developed

[29] See footnote 17.
[30] See footnote 6.

for other purposes that is increasingly being used to green the supply chain and can be further improved to support sustainable consumption and production.

IV. Role of civil society and consumers

37. Civil society organizations and the academic community have played an important role on sustainable consumption and production in raising awareness, developing tools (such as life-cycle analysis and footprinting), facilitating consumer-led initiatives or certification programmes (e.g., by Forest and Marine Stewardship Councils or on Fair Trade), and participating local actions and practical solutions.

38. Certification and labelling: sustainable consumption and production patterns are complex and particular to products, time and place, making it difficult to develop simple certification systems. There is now enough experience with different tools, ranging from disclosure of narrowly focused factual information (e.g., energy efficiency) to processes that involve voluntary third-party certification of compliance with comprehensive sustainability criteria. Lessons have been learned on balancing rigour and credibility with administrative burdens of certification and assurance. In some cases the value of certification has been less in the influence on the final consumer than in action to deal with problems exposed by certification procedures such as poor labour practices of subcontractors. In designing consumer information tools, there is a tension between comprehensive multi-attribute coverage and the desire to have rapid and broad-base impact on a scale to make a difference. Consumer International identified concerns that the number and range of labels is confusing consumers, thus reducing their effectiveness.

39. There are now a few global initiatives aiming at harnessing the growing ICT capacity to make transparency in products and suppliers the norm instead of the exception achieved by past certification schemes. These initiatives such as People 4 Earth and Wal-Mart's Live Better Index bring together Governments, the private sector and non-governmental organizations to reduce the confusion faced by consumers in exercising sustainable consumption choices. By setting core social, environmental and equity standards to be met, and progressively higher standards to be recognized and rewarded, these groups contribute to the progressive mainstreaming of sustainable consumption. Critical to such efforts will be institutional and technical support to building capacity of suppliers, especially small-scale ones, in developing countries to achieve core standards and to make continuous improvements.

Box 3
Biotechnology for sustainable products

Increasingly, both NGOs and the private sector recognize the value of partnership and increased transparency. Novozymes — a manufacturer of bioengineered enzymes — has opened its books to the World Wildlife Fund to explore, using Life Cycle Analysis, the greenhouse gas mitigation potential of industrial biotechnology. The resultant report concludes that industrial biotechnology has huge climate change mitigation potential, but what is even more important is that the report lays out a scenario of economies independent of fossil fuels and waste. Central to this is the use of biotech-based enzymes in the food and fuel industry to improve efficiency, as well as in products like detergents which do not require hot water. Bio-based materials can be used, including from recycled waste, to substitute for everyday products made from crude oil. This scenario is conditional on a strong and effective system of sustainable international policies and standards.

V. Policies and measures to transition to sustainable consumption and production

40. No single policy is likely to change unsustainable patterns of consumption and production. Yet, except for a few countries reviewed above, most countries still have no integrated framework and instead have policies, actions and programmes that address aspects of consumption or production individually.

A. Sustainable consumption

41. Despite clear evidence from market studies that awareness of environmental and social issues is entering the mainstream, many impediments remain. Currently approximately 15 per cent of Western consumers claim to take environmental and social issues into account in their consumption decisions. Yet, given that the market share of sustainable food, furniture, buildings, home and personal care products remains at about 1 per cent or less,[31] only a fraction of the societally conscientious consumers actually translate their concerns into purchases. The reasons include: (a) difficulty of access; (b) product performance (perceived or real); (c) the absence of easily understandable, multi-attribute and trustable labels; (d) price premiums perceived (at times rightly) as unaffordable for most people; and (e) force of habit.

42. There are three pathways by which sustainable consumption can be accelerated: (a) redesigning products, (b) shifting from consumption of products to services and (c) more conscious consumption.[32] Products can be redesigned so they are cleaner and safer and use energy more efficiently. Products can be made in

[31] A. White, "Consumption, Commerce and Citizenship: Values Transformation to Build a Sustainable World" (Washington, D.C., People 4 Earth, 2009).

[32] See footnote 5.

companies which pay fair wages to employees working in healthy workplaces and which treat animals humanely. Moving from a model of profitability based on selling products to one based on providing functionality-oriented services can enhance sustainability. Ways can often be found to deliver the services that customers want in ways which are less resource-intensive. Many argue, however, that a major shift from conspicuous to "conscious" consumption is needed to place economies on a sustainable path. This can be achieved through education and awareness-raising and by tools that provide consumers with on-the-spot, transparent and reliable information about products and producers.

Information and education

43. Sustainable consumption is still widely misperceived as "consuming less" rather than "consuming better" and making informed choices. Reorienting consumer preferences and purchasing decisions requires adequate and reliable information as well as education on environmental, economic and social issues. Mexico, Japan, Norway, Mauritius, Portugal and South Africa have introduced environment and sustainable development (sustainable consumption being a core component of sustainable development) into their curricula and teacher training as well as into wider public education programmes/campaigns.

44. Several tools are available to assist the integration of sustainable consumption into education. These include the UNEP/United Nations Educational, Scientific and Cultural Organization (UNESCO) Youth Xchange Guidebook, the Guidelines on Education for Sustainable Consumption "Here and Now!",[33] initiatives from civil society organizations (such as the Consumer Citizenship Network and the Center for Environmental Education), and such teacher training initiatives as the UNESCO "Guidelines and Recommendations for Reorienting Teacher Education to Address Sustainability" at the global level, or the Portuguese "Guide to Consumer Education" at the national level. Several surveys have tried to poll public opinion on sustainability issues; mention must be made of the 2009 Global Survey led by the Marrakech Task Force on Sustainable Lifestyles on how young adults perceive, imagine and shape sustainable lifestyles. Preliminary results show the higher receptivity among young adults of innovative solutions.

45. Growth in civic entrepreneurship has also contributed by challenging existing institutions and advancing alternative models for action by Governments, businesses and civic leaders, and seeking to translate expanded awareness into behavioural change.

46. Sustainability educating involves not simply information on "dematerialization" of consumption or an emphasis on services but also reducing negative environmental, social and cultural impacts of services themselves, e.g., tourism. The Marrakech Task Force on Sustainable Tourism Development has surveyed best practices and launched campaigns such as the Internet-based Green Passport campaign,[34] showcasing practical ways to protect the natural and cultural heritage. The development and dissemination of training manuals and e-learning tools focus on the main stakeholders of the tourism value chain.

[33] "Here and Now! Education for sustainable consumption" (UNEP and the Marrakech Task Force on Education for Sustainable Consumption, 2008). See www.unep.fr/scp/marrakech/taskforces/education.htm.

[34] International Task Force on Sustainable Tourism. See http://www.unep.fr/greenpassport.

Sustainable public procurement

47. When Governments make a concerted effort to purchase sustainable products and services, in addition to leading by example, their substantial buying power has the potential to create and drive markets for sustainable products both nationally and internationally.[35] Governments are the largest consumers in an economy. On average, total public expenditures by central and local Governments (including investment expenditures) are estimated to account for about 20 per cent of GDP in OECD countries, and roughly 15 per cent in non-OECD countries.[36] This is especially so in sectors such as defence, health and research, construction, energy and transport equipment sectors where the government is one of the largest customers. Creating economies of scale, the government purchase can lower the costs of clean technologies, making environment-friendly products more affordable to the entire population.

48. A well-documented success story is the market transformation in the United States following a 1993 Executive Order which required that the Federal Government purchase only Energy Star computer equipment. The Government of the United States being the largest purchaser of computers worldwide, the Executive Order led to a complete market transformation, and by the end of the 1990s, Energy Star computer equipment dominated the market.

49. Sustainable public procurement is gaining ground in both developed and developing countries. The process has been speeded up because of the work of the Marrakech Process Task Force on Sustainable Public Procurement. The Task Force has made available an online assessment tool and training materials for different stakeholders in the public procurement process and provided capacity-building training to several countries through an EU, Switzerland and Francophonie partnership.

50. International organizations like the United Nations and the Bretton Woods institutions themselves are major consumers of certain goods and services and have global operations with significant social and environmental impacts. Since 2007, the United Nations has adopted a strategy to move towards climate neutrality and sustainable management systems in all its programmes, funds and specialized agencies. This work is captured under the United Nations Climate Neutral Strategy facilitated by the inter-agency Environment Management Group.

Price signals

51. Although the Polluter Pays Principle has been given legal force in environmental legislation in many countries, environmental services from the atmosphere, soil and water are still mainly regarded as part of the global commons of "free goods" that are not priced and the costs of damage to the environment and society are still not integrated into production costs and prices. Until more progress is made in effectively applying the Principle, price signals will continue to fail to indicate relative scarcity of public goods and to provide incentives for consumers to choose sustainable options.

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[35] United Nations, Department of Economic and Social Affairs, "Public procurement as a tool for promoting more sustainable consumption and production patterns", Sustainable Development Innovation Briefs, Issue 5 (August 2008).

[36] See footnote 10.

52. To varying degrees many countries have espoused ecological tax reform, but technical, administrative and, not least, political difficulties have prevented major change. Denmark and Sweden have enacted (and the Scottish Parliament has voted) major tax reforms that reduce taxes on income while increasing taxes on polluting activities. Similar tax shifts are being discussed at local levels in the Canadian city of Winnipeg and the province of Ontario. At the local level, property taxes have been shifted from buildings to land to encourage denser development and discourage sprawl.

B. Sustainable production

53. The last two decades have been a time of unprecedented expansion of the global economy. One feature has been the inexorable rise in the proportion of manufacturing output that is internationally traded, with international trade in manufactured goods growing from 32.5 to 41.5 per cent of world GDP between 1990 and 2003.[37] Despite some progress towards improved materials and energy efficiency in production processes, the global economy is still producing more and more products with shorter lives, using more physical resources. But recent increases in commodity prices and growing concerns related to waste may be a sign of increasing pressure to conserve material inputs and energy. With material and energy input prices expected to continue to rise as soon as the global recession is over, eco-efficiency opportunities become more attractive.

54. The growth in world trade and in global supply chains and networks has magnified both the challenges and opportunities of sustainable consumption and production. While economic development has brought many millions out of poverty, the lifestyles to which many aspire, and which globalization has enabled increasing numbers around the world to enjoy, are not sustainable on a business-as-usual basis. Moreover, globalization has also magnified gaps between rich and poor, within and between countries and regions, with consequent social and political impacts and tensions, for example, related to migration.

55. The growth of trade in manufacturing has been accompanied by a relocation of production of many manufactured goods from developed to developing and transition economies. The production process is increasingly broken down into tasks and subprocesses which are linked through trade in components, assemblies and subsystems. As a result, manufacturing is becoming less vertically integrated and the old image of raw materials entering at one end of a huge factory and coming out at the other end as a final product is less and less applicable.

56. The inability of companies to identify the sources of material inputs and components, no less determine the sustainability of suppliers' practices, has convinced some manufacturers and retailers to expand the scope of their responsibilities up their supply chains. They have taken a direct and positive interest in strengthening weak links in that chain. The promotion of sustainable production requires a systematic and coordinated effort to influence business practices across

[37] UNIDO, *Industrial Development Report 2009. Breaking in and Moving Up: New Industrial Challenges for the Bottom Billion and the Middle-income Countries*, ISBN: 978-92-1-106445-2 (UNIDO, Vienna, 2009).

global supply chain networks and to build the capacities in developing and transition economies to industrialize on a sustainable basis.

57. Over the last few decades, significant progress has been made on improving understanding of the adverse environmental and social impacts of industrial production processes and in the development of tools and techniques to improve resource efficiency (for example, making metal and glass food and beverage containers stronger but lighter, and facilitating recycling by designing motor vehicles in ways that make disassembly easier) and reduce environmental impacts (for example, replacing solvent-based paints and adhesives with water-based and other alternatives). Certification requiring Life Cycle Analysis has been instrumental in facilitating resource-efficient, cleaner production and decent work conditions, but more needs to be done to make sustainable production the norm across all sectors and countries. Key to this transition is consistent and transparent government policies and guidance, the active involvement and leadership of multinational corporations in promoting sustainable production practices along their global supply chains, and monitoring and oversight by civil society and academia. Public-private partnerships can play a vital role in supporting small and medium enterprises to meet more demanding standards. Strengthening the existing engagement of the United Nations family with global businesses through mechanisms such as the United Nations Global Compact and through technical cooperation programmes such as those of the United Nations Industrial Development Organization (UNIDO) can help in this regard.

58. Certification schemes have also helped to encourage progress on reducing the resource and pollution intensity of products as well as enhancing positive social impacts in developing countries. Fair Trade-certified goods such as coffee, tea, bananas, handicrafts, sugar, cocoa, wine and honey guarantee a minimum, higher than market price to producers by eliminating middlemen. In 2008, Fair Trade-certified sales amounted to approximately US$ 4.08 billion worldwide, a 22 per cent year-to-year increase. Fair Trade products generally account for 1 to 20 per cent of all sales in their product categories in Europe and North America. In June 2008, it was estimated that over 7.5 million producers and their families were benefiting from Fair Trade-funded infrastructure, technical assistance and community development projects. These projects are valuable because, among other things, they provide capacity-building to producers (mainly small producers) so they can meet the best practices required for certification. Yet at present only a tiny proportion of producers are reached, so programmes to scale up the transfer of best practices and to ensure decent jobs and prices could be more broadly spread.

59. Competitive markets can provide powerful levers for changing production patterns but, on the other hand, competitiveness concerns are a frequent obstacle, inhibiting collaboration between rivals in improving standards. Also, voluntary and other standards increasingly risk becoming barriers to trade for developing countries, especially for small and medium enterprises. Aid for Trade[10] and other programmes have started providing capacity-building to ensure that the private sector can meet these new standards, and the EU offers a web-based Export

[10] Aid for Trade aims to help developing countries, particularly least developed countries, develop the trade-related skills and infrastructure that is needed to implement and benefit from World Trade Organization agreements and to expand their trade. See http://www.wto.org/english/tratop_e/devel_e/a4t_e/aid4trade_e.htm.

Helpdesk to provide advice and information to developing countries.[39] But more needs to be done. The resource-efficient and Cleaner Production Programme of National Cleaner Production Centres established in developing countries by UNEP and UNIDO has been developed to scale up technical support and capacity-building. This network of centres now covers 42 developing and transition economies.

60. A 2007/2008 evaluation of the UNIDO-UNEP Cleaner Production Programme[40] confirmed sustained success in the building up of and strengthening of local institutions to provide services that have achieved uptake of Cleaner Production by enterprises, government institutions and other organizations. The evaluation concluded that in terms of institution-building and strengthening this approach has been appropriate for the situation in most developing and transitional countries. But it also suggests a number of improvements, including building and maintaining a network of expert institutions to allow programme management to draw on available expertise and promote North-South and South-South cooperation.

VI. Continuing challenges and obstacles

61. The goal for the eighteenth session of the Commission on Sustainable Development is to identify challenges and obstacles that hinder the move towards sustainable patterns of consumption and production, and that of the nineteenth session is for the international community to agree on a framework of programmes in support of sustainable consumption and production. Together, the eighteenth and nineteenth sessions of the Commission offer the opportunity to learn from recent experience, create awareness of long-term sustainability and equity considerations, and build a coherent programme (the 10-year framework of programmes) to address sustainability challenges:

- Institutionalizing sustainable consumption and production concerns into education systems as well as systems of local, national, corporate and international governance
- Identifying priority actions and initiatives at different levels
- Support peer-to-peer learning
- Mobilizing support for scaling up successful initiatives and programmes
- Encouraging economic and financial policies and public and private investments which promote sustainability
- Providing an enabling environment for and supporting research, innovation and development in critical areas.

[39] http://exporthelp.europa.eu/display.cfm?page=intro/intro_Welcome.html&docType=main&languageId=EN.

[40] UNIDO and UNEP, Independent Evaluation of the UNIDO-UNEP Cleaner Production Programme (UNIDO, Vienna, 2008).

62. Guiding objectives for such a programme remain the same as in Johannesburg:[41]

- Ensure that the living standards of the poor are progressively raised even as consumption choices of the rich become less resource-intensive and environmentally damaging
- Decouple economic growth from environmental degradation in relative and wherever possible absolute terms, consistent with poverty eradication and universal human development
- Stimulate demand for and supply of sustainable products and services
- Promote more sustainable and low-carbon consumption choices and lifestyles
- Enhance social development through investment in people and communities as highlighted, e.g., in a Global Green New Deal.[42]

63. In order to be meaningful, the programme may consider concrete targets. What would represent meaningful progress towards sustainable consumption and production by 2020? How are the goals to be differentiated across countries at different levels of development? One possible starting point for answering these questions is the set of regional priorities and strategies identified through regional implementation meetings of the Commission on Sustainable Development as well as under the umbrella of the Marrakech Process.

64. The African Round Table identified several obstacles to sustainable consumption and production. Some are relevant to all regions:[43]

(a) Poor education and lack of awareness of the benefits of sustainable consumption and production among all stakeholders;

(b) Government failures (lack of legislation and/or enforcement; weak recognition of sustainable consumption and production in most policies);

(c) Underpricing of natural resources and non-pricing of pollution.

65. Others are more particular to developing countries:

(a) Inadequate data on resource use efficiency and pollution; weak monitoring of economic activities which deplete resources and degrade the environment;

(b) Reliance on obsolete and inefficient technologies; lack of information and knowledge about sustainable management practices in various economic sectors;

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[41] Marrakech Process, "Proposed Input to the Commission on Sustainable Development at its eighteenth and nineteenth sessions on a 10-Year Framework of Programmes on Sustainable Consumption and Production". Third Public Draft (2 September 2009). See http://esa.un.org/marrakechprocess/draft10YFPInput.shtml.

[42] www.un.org/esa/policy/policybriefs/policybrief12.pdf and http://www.unep.org/greeneconomy.

[43] "Africa Review Report on Sustainable Consumption and Production" (African Round Table on Sustainable Consumption and Production, Dar es Salaam, 2008). See www.arscp.org.

(c) Lack of technical capacity (e.g., for product development and formulating bankable cleaner production projects; for design of effective and equitable sustainable consumption and production policies by Governments; for implementation of sustainable public procurement policies);

(d) Economic (lack of appropriate financing mechanisms for sustainable consumption and production investments; lack of financial incentives; widespread poverty);

(e) Organizational (weak institutions for designing and implementing policies and regulations; absence of collaborative projects and exchange programmes to facilitate knowledge-sharing at the regional level).

66. Other obstacles identified in other regional consultations and processes include:

- Lack of programmes to support small and medium enterprises and incentives for them to incorporate social and environmental management into their process (the Economic Commission for Latin America and the Caribbean (ECLAC) region)
- Lack of sustainable products available at affordable prices, especially food items that represent a large share of the poor's expenditures (the ECLAC region)
- Lack of adoption of more concrete goals and sustainable consumption and production targets at the regional and national levels (the Economic Commission for Europe (ECE) region)
- Lack of integrated policy appraisal
- Lack of engagement in changing lifestyles tailored to different social segments of society (the ECE region)
- Lack of policies to foster system innovations, enhance the internalization of externalities and shift from material-based consumption to "dematerialized" consumption
- Changing the role of government from regulator to agent of change supporting collective actions that engage all stakeholders.

67. The common programme must have the capacity to address the major strategic obstacles identified above. In terms of its components, it would need knowledge-sharing, access to tools and methodologies, training and technical support and capacity-building. A 10-year framework of programmes could, at a minimum, provide a way of organizing and sharing knowledge and information and of continually updating the knowledge base with new lessons generated from experience on the ground. Governments and other stakeholders could also benefit from access to tools and methodologies for promoting sustainable consumption and production across the full spectrum of economic decisions, from public procurement to management of global supply chains to cleaner production to sustainable consumption. Beyond consolidating tools into ready-at-hand toolkits, the programme could also usefully provide a platform for training government policymakers and other stakeholders in the use of the relevant tools. The programme could help decision makers to select and apply the proper mix of programmes and policies to address obstacles and barriers specific to countries, sectors and segments of society. Finally, the programme could usefully provide a vehicle to help to match actions at all levels with technical support and financial resources.